

# Case Consulting Laboratories, Inc.

145436



622 ROUTE TEN  
WHIPPANY, NEW JERSEY 07981  
(201) 428-9666

1981 JUL 13 AM 3:00

EPSTEIN, EPHRAIM  
BROWN, ROSEK  
& TURNER

NOVEMBER 13, 1980

TO: BORNE CHEMICAL COMPANY, INC.  
632 SOUTH FRONT STREET  
ELIZABETH, NEW JERSEY 07207

ATTENTION: MR. H. BRUNNWASER, VICE PRESIDENT

FROM: PATRICIA T. MCGARRY

PROJECT NO.: 00283

SUBJECT: CASE CONSULTING LABS.  
CONTROL NUMBER

## CLIENT IDENTIFICATION

80-1296  
80-1297  
80-1298  
80-1299  
80-1300  
80-1303  
80-1304  
80-1386  
80-1387

TK24 TOP  
TK27 TOP  
TK32 X  
TK22  
TK29  
TK42 TOP  
TK33 TOPX  
26 -  
31

PURPOSE: CHARACTERIZATION OF THE SUBMITTED SAMPLES BY INFRARED ANALYSIS.

PROCEDURE: A THIN FILM OF EACH SUBMITTED SAMPLE WAS PLACED BETWEEN SODIUM CHLORIDE PLATES AND SCANNED FROM 4000 TO 200 CM<sup>-1</sup> WITH A RECORDING INFRARED SPECTROPHOTOMETER. THE SPECTRA WERE THEN EXAMINED FOR ABSORPTION BANDS CHARACTERISTIC OF ORGANIC FUNCTIONAL GROUPS.

RESULTS: OUR RESULTS ARE SHOWN IN EXHIBIT I, ATTACHED.

CONCLUSIONS: BECAUSE ALL OF THE SUBMITTED SAMPLES APPEAR TO BE MIXTURES, RATHER THAN PURE, SINGLE COMPOUNDS, FUNCTIONAL GROUP BAND OVERLAPPING PRECLUDES POSITIVE IDENTIFICATION OF ESTERS, SULFONATES, NITRO COMPOUNDS AND INDIVIDUAL AROMATIC ISOMERS. HOWEVER, THE FOLLOWING GENERAL OBSERVATIONS MAY BE MADE FROM THE SPECTRA:

EXHIBIT I(1)  
BORNE CHEMICAL COMPANY, INC.  
TEST RESULTS

CASE CONSULTING LABS.  
CONTROL NUMBER

BAND LOCATION, CM<sup>-1</sup>

FUNCTIONAL GROUP

80-1296

3700, 3100, 1645  
2930, 2850, 1465  
2960, 2870, 1375  
1200, 1065

OH  
CH<sub>2</sub>  
CH<sub>3</sub>  
SUGGESTS S=O SULFONATE

80-1297

2920, 2850, 1465  
2950, 2860, 1375  
1600, 1510  
700-900

CH<sub>2</sub>  
CH<sub>3</sub>  
C=C AROMATIC  
MIXED AROMATIC ISOMERS

80-1298

2920, 2860, 1460  
2950, 2870, 1375  
1600, 1515  
700-900

CH<sub>2</sub>  
CH<sub>3</sub>  
C=C AROMATIC  
MIXED AROMATIC ISOMERS

80-1299

3400  
2930, 2860, 1460  
2950, 2870, 1375  
1745, 1720  
1610, 1590, 1515  
1265, 1235, 1180, 1170, 1035  
690-910

OH  
CH<sub>2</sub>  
CH<sub>3</sub>  
C=O ESTER  
C=C AROMATIC  
C-O-C ESTER  
MIXED AROMATIC ISOMERS

80-1300

2920, 2850, 1460  
2950, 2865, 1375  
1735  
1605, 1595, 1510  
1530, 1350  
680-900

CH<sub>2</sub>  
CH<sub>3</sub>  
C=O ESTER  
C=C AROMATIC  
SUGGESTS NO<sub>2</sub> ALIPHATIC  
MIXED AROMATIC ISOMERS

80-1303

2920, 2850, 1465  
2950, 2860, 1375  
1735  
1600, 1510  
700-900

CH<sub>2</sub>  
CH<sub>3</sub>  
C=O ESTER  
C=C AROMATIC  
MIXED AROMATIC ISOMERS

EXHIBIT I(2)  
BORNE CHEMICAL COMPANY, INC.  
TEST RESULTS

CASE CONSULTING LABS.  
CONTROL NUMBER

BAND LOCATION, CM<sup>-1</sup>

FUNCTIONAL GROUP

80-1304

2920, 2850, 1460  
2950, 2870, 1375  
1600, 1510  
700-900

CH<sub>2</sub>  
CH<sub>3</sub>  
C=C AROMATIC  
MIXED AROMATIC ISOMERS

80-1386

2920, 2850, 1465  
2950, 2870, 1375  
1730, 1740  
1600, 1510  
1260, 1120, 1070  
700-900

CH<sub>2</sub>  
CH<sub>3</sub>  
C=O ESTER  
C=C AROMATIC  
C-O-C ESTER  
MIXED AROMATIC ISOMERS

80-1387

2920, 2850, 1465  
2950, 2870, 1375  
1610, 1590, 1510  
700-900

CH<sub>2</sub>  
CH<sub>3</sub>  
C=C AROMATIC  
MIXED AROMATIC ISOMERS

SOURCE: CASE CONSULTING LABORATORIES, INC.

# Case Consulting Laboratories, Inc.

622 ROUTE TEN  
WHIPPANY, NEW JERSEY 07981  
(201) 426-9668

OCTOBER 1, 1980

TO: BORNE CHEMICAL COMPANY, INC.  
632 SOUTH FRONT STREET  
ELIZABETH, NEW JERSEY 07207

ATTENTION: MR. A. J. CORONA, GENERAL MANAGER

FROM: ROBERT BARNES, PH.D.

PROJECT NO.: 00205 -- REVISED

SUBJECT: ANALYSIS OF 13 SAMPLES OF WATER AND OIL

PURPOSE: TO DETERMINE THE POLYCHLORINATED BIPHENYL (PCB) CONTENT OF THE SUBJECT SAMPLES.

PROCEDURE: 1. PCBS IN WATER

THE PROCEDURE FOLLOWED IS "METHOD FOR POLYCHLORINATED BIPHENYLS (PCBS) IN WATER AND WASTEWATER," IN METHODS FOR BENZIDINE, CHLORINATED ORGANIC COMPOUNDS, PENTA-CHLOROPHENOL AND PESTICIDES IN WATER AND WASTEWATER, U.S.E.P.A., E.M.S.L., SEPTEMBER, 1978. IN BRIEF, THE PROCEDURE INVOLVES THE FOLLOWING STEPS:

- THE SAMPLE PH IS ADJUSTED TO 6.5 TO 7.5
- THE PCBS ARE THEN EXTRACTED WITH THREE 60 ML PORTIONS OF 15 PERCENT METHYLENE CHLORIDE IN HEXANE
- THE EXTRACTS ARE DRIED WITH ANHYDROUS SODIUM SULFATE AND CONCENTRATED IN A KUDERNA DANISH EVAPORATOR
- THE PCB CONTENT OF THE CONCENTRATE IS DETERMINED BY ELECTRON CAPTURE GAS CHROMATOGRAPHY
- CONCENTRATES WERE CLEANED UP BY CHROMATOGRAPHY ON SILICA GEL, AS DESCRIBED IN THE FOLLOWING PROCEDURE FOR PCBS IN OILS AND THEN REANALYZED BY GAS CHROMATOGRAPHY

R. A. J. CORONA  
BORNE CHEMICAL COMPANY, INC.  
OCTOBER 1, 1980  
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PROCEDURES  
CONTINUED:

- TEMPERATURES -- COLUMN: 200°C, INJECTOR: 240°C, MANIFOLD: 240°C, DETECTOR: 250°C
- RANGE -- X1
- ATTENUATION -- X128, OR AS REQUIRED
- DETECTOR -- PULSED
- INJECTION VOLUME -- ONE TO SIX MICROLITERS
- CHART SPEED -- ONE MINUTE PER CENTIMETER.

RESULTS:

RESULTS FOR THE WATER SAMPLES ARE GIVEN IN UNITS OF PARTS PER BILLION (PPB) IN EXHIBIT I, ATTACHED. TK34 TOP WAS THE ONLY SAMPLE FOUND TO CONTAIN PCBS AND CONTAINED A TOTAL OF 413 PPB SPREAD OVER THE TYPES A-1260, A-1254 AND A-1248.

RESULTS FOR THE OIL SAMPLES ARE GIVEN IN UNITS OF PARTS PER MILLION (PPM) IN EXHIBIT II, ATTACHED. THE HIGHEST LEVEL OF PCBS WAS OBTAINED IN TK32 WHICH WAS SUBMITTED IN DUPLICATE. EACH SAMPLE WAS ANALYZED IN DUPLICATE TO GIVE THE FOLLOWING VALUES:

- TK32: 54,47
- TK32: FIELD SAMPLED 9-19-80: 44,47

THE AVERAGE OF THE FOUR DETERMINATIONS IS 48 PPM.

RESPECTFULLY SUBMITTED,

*Robert Barnes*

ROBERT BARNES, PH.D.  
MANAGER, CHEMICAL AND  
ANALYTICAL SERVICES

CASE CONSULTING LABORATORIES, INC.

ATTACHMENTS

RB

EXHIBIT I  
BORNE CHEMICAL COMPANY, INC.  
RESULTS OF WATER ANALYSES

<u>C.G.L. CONTROL NUMBER</u>	<u>BORNE IDENTIFICATION</u>	<u>TYPE OF PCB PRESENT</u>	<u>LEVEL (PPB)</u>
80-1294	DIKE, GROUND WATER BETWEEN TK42 AND TK32	-	< 2*
80-1295	DIKE, GROUND WATER BEHIND TK36	-	< 2*
80-1301	TK23	-	< 1*
80-1302	TK34 TOP	A-1260 A-1254 A-1248	95 28 290
			413 TOTAL
80-1305	TK27 TOP	-	< 1*

\* NOT FOUND, LESS THAN NUMBER SHOWN WHICH IS THE DETECTION LIMIT.

SOURCE: CASE CONSULTING LABORATORIES, INC.

MR. A. J. CORONA  
BORNE CHEMICAL COMPANY, INC.  
OCTOBER 1, 1980  
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PROCEDURES  
CONTINUED:

- THE DETECTION LIMIT OF THE PCBS DEPENDS ON THE SIZE OF THE SAMPLE EXTRACTED. THE USUAL SAMPLE VOLUME IS ONE LITER OF WATER. HOWEVER, IF THE SAMPLE CONTAINS TOO MUCH HEXANE/METHYLENE CHLORIDE SOLUBLE MATERIAL, A SMALLER SAMPLE IS TAKEN AND A HIGHER DETECTION LIMIT RESULTS.

2. PCBS IN OIL

THE PROCEDURE WAS RECOMMENDED BY U.S.E.P.A. IN EDISON, NEW JERSEY. IN BRIEF, THE PROCEDURE INVOLVES THE FOLLOWING:

- A TWO ML ALIQUOT OF OIL IS DILUTED TO 100 ML WITH HEXANE
- ANHYDROUS SODIUM SULFATE IS ADDED TO THE DILUTION TO REMOVE WATER
- A ONE ML ALIQUOT OF THE DILUTION IS TRANSFERRED TO A CHROMATOGRAPHIC COLUMN CONTAINING ONE GRAM OF FULLY ACTIVATED SILICA GEL FOR CLEANUP
- THE PCBS ARE ELUTED FROM THE COLUMN WITH 20 ML OF HEXANE
- THE ELUATE IS CONCENTRATED IN A KUDERNA DANISH EVAPORATOR
- THE PCB CONTENT IS DETERMINED BY ELECTRON CAPTURE GAS CHROMATOGRAPHY.

3. CHROMATOGRAPHIC CONDITIONS

- INSTRUMENT -- PERKIN-ELMER 900B GAS CHROMATOGRAPH EQUIPPED WITH A NICKEL-63 ELECTRON CAPTURE DETECTOR
- COLUMN -- SIX FEET BY 1/4 INCH O.D. (FOUR MM I.D.) GLASS PACKED WITH 1.5 PERCENT SP-2250/1.95 PERCENT SP-2401 ON SUPELCOPORT 100/120
- CARRIER -- FIVE PERCENT METHANE/95 PERCENT ARGON AT 60 ML/MINUTE